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Biosurfactant from corn-milling industry improves the release of phenolic compounds during red winemaking

AIM: Biosurfactants can be used as emulsifier agents to improve the taste, flavour, and quality of food-products with minimal health hazards [1]. They are surface-active compounds with antioxidant and solubilizing properties [2]. In this study, a biosurfactant has been evaluated during red winemaking for its effect on fermentation dynamics, phenolic compounds extraction, and colour stabilization.

METHODS: The biosurfactant used was obtained from a fermented residual stream of corn-milling industry, named corn steep liquor (CSL). The harvested mass from Merlot winegrapes was distributed in 12 fermentation flaks with the same proportion of grape juice and solid parts. Six of them were added with CSL biosurfactant (1 g/L) whereas the other six were not added (control). Two fermentation protocols were assessed (spontaneous and *Saccharomyces cerevisiae* inoculated). Fermentation dynamics and kinetics, standard chemical parameters, colour characteristics, and phenolic composition were determined during maceration and at the end of malolactic fermentation. **RESULTS:** During inoculated maceration, the biosurfactant-added samples showed significantly higher values of total polyphenols and colour intensity when compared to control, and lower ones of the three colour CIEL*a*b* coordinates (lightness, red/green, and yellow/blue). At the end of alcoholic fermentation, a higher percentage of more stable polymerized pigments was also observed. The final wine resulted to be richer in total polyphenols and anthocyanins, as well as in high molecular weight flavanols for the biosurfactant-added samples. **CONCLUSIONS:** The biosurfactant addition did not affect negatively on inoculated fermentation dynamics and influenced positively the colour stability after malolactic fermentation resulting in darker and bluish wines. No significant changes on colour properties and related compounds were observed when spontaneous fermentation was performed.

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